EPA Region 5 Records Ctr.

387499

REGION 5 RAC2

REMEDIAL ACTION CONTRACT FOR

Remedial, Enforcement Oversight, and Non-Time Critical Removal Activities at Sites of Release or Threatened Release of Hazardous Substances in Region 5

BASIS OF DESIGN DOCUMENT

Eagle Zinc OU1 Site

Hillsboro, Illinois Remedial Action

WA No. 67-RDRD-B5Y7/Contract No. EP-S5-06-01

October 2010

PREPARED FOR

U.S. Environmental Protection Agency



PREPARED BY

CH2M HILL

TEMPORARY LANDFILL COVER

EAGLE ZINC SITE OPERABLE UNIT 1 Hillsboro, Illinois

Remedial Design

WA No. 69-RICO-B5Y7 / Contract No. EP-S5-06-01

October 2010

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Acronyms and Abbreviations

OU operable unit

RCRA Resource Conservation and Recovery Act

RD remedial design ROD record of decision

USEPA United States Environmental Protection Agency

Introduction

1.1 Purpose and Scope

This report describes the assumptions and guidelines underlying the proposed remedial design (RD) as defined in the record of decision (ROD) issued on September 16, 2009, Preliminary Remedial Design for the Engle Zinc Site Operable Unit 1 (OU1) Temporary Landfill Cover, Montgomery County, Illinois, performed by CH2M HILL for the United Sates Environmental Protection Agency (USEPA). The RD was prepared in accordance with USEPA Work Assignment No. 067-RDRD-B5Y7 under Contract No. EP-S5-06-01.

1.2 Site Background

The Eagle Zinc Site is located in the northeast sector of Hillsboro, Illinois, approximately 50 miles northeast of St. Louis, Missouri. The site is mixed commercial/industrial/ residential area. The site is 132 acres with about 30 acres of buildings and associated structures. There are about 23 buildings onsite that were previously used for facility operations. The types of buildings include offices, laboratories, manufacturing/processing, equipment/raw material/finished product storage, bag houses, and maintenance facilities. Also located on the site are railroad spurs, raw material and residual material, two stormwater retention ponds, a small pond, and several roads. The site was historically used for oxide production, zinc smelting, and related operations for about 90 years, until 2003. The area has been zoned commercial/ industrial, and there are no plans to rezone the area for other uses. The site has been divided into two operable units (OUs): OU1 addresses the interim remedial action concerning the contaminated buildings, while OU2 addresses the contamination at the entire site (USEPA 2009). The buildings (OU1) are the focus of this RD.

Previous investigations have taken place since the early 1980s. The initial remedial investigation started in 2001, and a draft remedial investigation report was produced in 2005. The previous investigations show multiple residue piles throughout the site that exceed screening levels. The contaminants of concern onsite include lead and cadmium. Other contaminants onsite include copper, zinc, and manganese. In 2008, the buildings and associated structures onsite were sampled by x-ray fluorescence and revealed significantly high levels of lead concentrations in, on, and around the building structures. The sampling event led to USEPA's decision to complete an interim action to address the immediate threat posed by the buildings. A removal action was conducted in January 2009 to quickly mitigate site access and exposure, and the action consisted of fence installation around the most accessible areas of the site.

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1.3 Summary of the Selected Remedy

The preferred remedy presented in the interim ROD (USEPA 2009) consists of the following elements:

- Building Demolition The demolition of all buildings onsite, including manufacturing buildings, office buildings, and laboratories.
- Offsite Disposal of Asbestos-Containing Materials and putrescible wastes—Proper offsite disposal of asbestos-containing materials and putrescible wastes.
- Recycling Recycling of steel, metal, bricks, and other recyclable materials. Any material
 eligible for recycling will be decontaminated to a level of contamination acceptable to
 the recycling facility.
- Onsite Management Cell with Soil Cover—Consolidation of demolition debris and a
 1-foot soil cover will be placed onsite to temporarily manage the consolidated debris.
 The vegetative portion of the soil cover will use native grasses, which will require
 limited maintenance.
- Management of Wastes Nonhazardous waste will be managed onsite under the 1-foot soil cover. Any hazardous waste will be placed onsite and will be managed consistently with Resource Conservation and Recovery Act (RCRA) waste pile requirements and incorporated into the final remedial action.

The final remedial action at the site will address remaining media and will be addressed under OU2 of the Eagle Zinc Site.

The onsite management cell will consist of all remaining debris and will be located in the southwest corner of the site (Drawing C-1). The cell will be approximately 1.4 acres in size (250 feet by 250 feet) by 5 feet high. The cell will be located approximately 100 feet north of the southern boundary of the site.

A soil cover will be placed on top of the debris. The soil cover will include a 6-inch low-permeability clay layer and 6-inch soil/vegetative layer. The vegetative layer will be made up of native vegetation. The soil cover will act as physical barrier to the contaminated debris left onsite. No RCRA hazardous waste will be placed in the management cell. The soil cover will prevent direct contact and will limit potential for infiltration and leaching of lead from the material for the time it is staged prior to implementation of the final remedy.

Limited maintenance will be associated with the soil cover. The maintenance will include six annual maintenance events over the course of 5 years or until the final remedial action begins.

1.4 Future Land Use

The site has been zoned industrial/commercial by the city of Hillsboro, and deed restrictions on the property limit the site to industrial and commercial purposes in the future. The deed restrictions also prohibit interference with USEPA selected remedial actions for the site. Local authorities have expressed significant interest in redeveloping the site for commercial/industrial use. Land surrounding the property consists of recreational and residential land use and such land uses are not anticipated to change.

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Preliminary Remedial Design

The estimated limit of the management cell is shown in Drawing C-2. The limit of the cover is approximately 1.4 acres. A 1-foot-thick vegetative cover system has been proposed for the management cell. The temporary elements will be protective of humans and the environment in combination with the other RD elements.

2.1 Vegetative Layer

One foot of soil cover is required in accordance with the ROD. The top 6 inches of soil cover will consist of topsoil as described above. The remaining 6 inches will be a vegetative support layer consisting of clean onsite or offsite clayey sand or lean clay. The vegetative support layer stores moisture to sustain vegetation during dry weather conditions and also serves as a barrier layer with a hydraulic conductivity of less than 1×10^{-5} centimeters per second. The lower 4 inches if the vegetative layer will be compacted. The upper 2 inches will be tracked in with construction equipment and will provide support for root zone development.

2.2 Slopes

The slopes shown on the final cover grading plans (Drawing C-3) are based on a maximum 5:1 horizontal to vertical slope a minimum 5 percent slope The onsite management cell is set forth in the decision documents to accommodate approximately 11,200 cubic yards. The cell shown in the documents can accommodate 11,600 cubic yards. The design presented for the cell in the final documents will present grading options for different configurations to allow for an increase or decrease in the amount of waste generated during demolition activities.

2.3 Stormwater Management

The Eagle Zinc Site currently has four surface water ponds. A southwestern stormwater retention pond, two engineered stormwater retention ponds located near the eastern site property boundary, and a small pond located in the southeastern part of the site. The southwestern stormwater retention pond receives a large proportion of the site's stormwater runoff. Stormwater intermittently discharges westward from this pond to a drainage swale, which in turn discharges to an unnamed tributary of the Middle Fork of Shoal Creek. This outfall was previously permitted with the Illinois Environmental Protection Agency Division of Water Pollution Control as National Pollutant Discharge Elimination System Outfall 001. The Middle Fork of Shoal Creek flows southwestward and joins Shoal Creek approximately 6 miles southwest of the site.

Stormwater that originates in most of the manufacturing areas and the eastern part of the site enters an engineered stormwater retention system located near the eastern property boundary. The stormwater normally evaporates from the retention system; however, periodically stormwater discharges from the retention pond to a drainage swale that channels the stormwater off the site property to the east.

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The southeastern pond is located between two railroad spurs near the entrance to the plant. This pond does not appear to receive water runoff and has no inlet or outlet. In addition, stormwater that collects in a limited area along the southern site boundary discharges to a small stream located south of the site.

Stormwater runoff—overland flow—from the newly constructed temporary soil cover will exit the cover surface by sheet flow and drain to the southeastern pond. Stormwater details will be completed in the final design and are not presented here.

2.4 Design Drawings

Preliminary design drawings that present the concepts to be used in the final design of the Eagle Zinc Site RD have been prepared and are presented in Appendix A.

2.5 Technical Specifications

A preliminary list of technical specifications has been prepared for remedial action construction of the temporary soil cover at the Eagle Zinc Site and is presented in Table 2-1.

TABLE 2-1
Preliminary RD Specification List

	RD Specification List
Section	Description
01010	Summary of work
01025	Measurement and payment
01040	Coordination
01092	Abbreviations and Definitions
01100	Field Engineering/Surveying
01200	Project meetings
01300	Submittals
01310	Progress schedules
01320	Construction Photographs
01400	Quality control
01500	Construction facilities and temporary controls
01501	Health and safety provisions
01502	Environmental protection
01570	Soil erosion and sediment control
01600	Material and equipment
01780	Contract closeout
02200	Site preparation
02210	Site Clearing and Grubbing
02220	Erosion and Sediment Control
02230	Site Grading and Subgrade Preparation
02250	Excavation
02300	Fill and backfill
02400	Cover Soil
02500	Topsoil (Vegetative Layer)
02920	Seeding

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2.6 Erosion and Sediment Control

Erosion and sediment controls will comply with applicable local and state requirements. However, details are not provided in this preliminary RD. A discussion of temporary and permanent erosion and sediment controls is presented in the following sections.

2.6.1 Temporary Erosion and Sediment Controls

The temporary erosion and sediment controls will be provided by means of temporary erosion control matting and straw applications. During construction, the sediment control will be accomplished by installing silt fences and dikes downstream of the construction areas.

Landfill Cover

After the vegetative layer of the soil cover is installed and seeded, straw mulch will be applied at a rate of 3 tons per acre as a temporary erosion control measure. The straw mulch will be crimped in order to prevent it from blowing away.

Slopes

All side slopes of the landfills will be less than 5H:lV and will have temporary erosion control matting for protection against erosion until the vegetation is established. The erosion control matting will be secured in place using nonmetallic anchoring devices.

2.6.2 Permanent Erosion and Sediment Controls

The permanent erosion and sediment controls include vegetation on landfill cover and slopes.

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SECTION 3

Cost Estimate

A preliminary cost estimate for construction and implementation of the selected remedy for the temporary soil cover for the Eagle Zinc Site, as described in this report, has been prepared with the interim ROD and includes life-cycle cost estimates for design, regulatory processes, construction, operation and maintenance, and long-term performance and monitoring costs.

The Class 4 estimate is prepared based on limited information, where little more than proposed facility type, its location, and building sizes are known. Strategic planning purposes include but are not limited to, market studies, assessment of viability, evaluation of alternate schemes, project screening, location and evaluation of resource needs and budgeting, and long-range capital planning. Examples of estimating methods used would include cost/capacity curves and factors, scale-up factors, and parametric and modeling techniques. Typically, little time is expended in the development of this estimate. The expected accuracy ranges for this class 4 estimate are –15% to -30% percent on the low side and +10% to +50% percent on the high side.

It is estimated that the total capital cost for implementation of the selected remedy for the Eagle Zinc Site OU1 temporary soil cover is \$387,000. The costs will be revised during the final design process to reflect the final design grades, slopes, surface water features, and other design considerations not included in the preliminary design. Details of the cost estimate are presented in Appendix B.

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SECTION 4

References

USEPA. 2009. Interim Record of Decision for the Eagle Zinc Site, Operable Unit 1: Building Demolition.

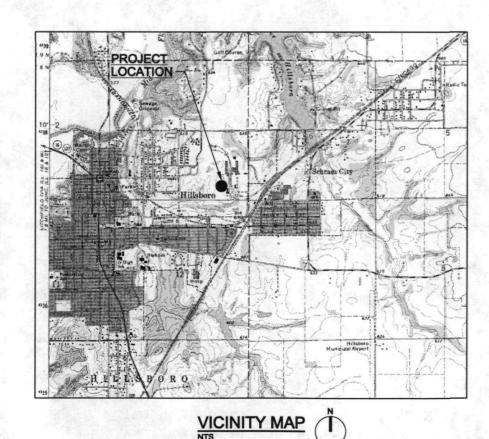
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Appendix A Preliminary Design Drawings

US ENVIRONMENTAL PROTECTION AGENCY PRELIMINARY REMEDIAL DESIGN EAGLE ZINC SITE

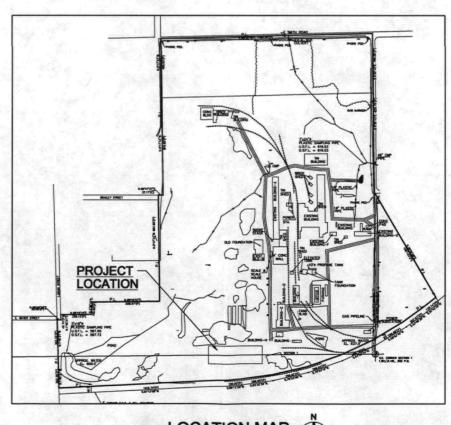
WA No. 067-RD-RD-B5Y7 CONTRACT NO. EP-S5-06-01

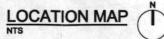
HILLSBORO, ILLINOIS

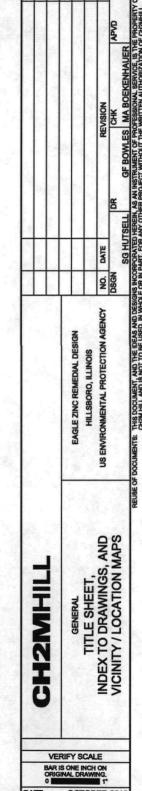


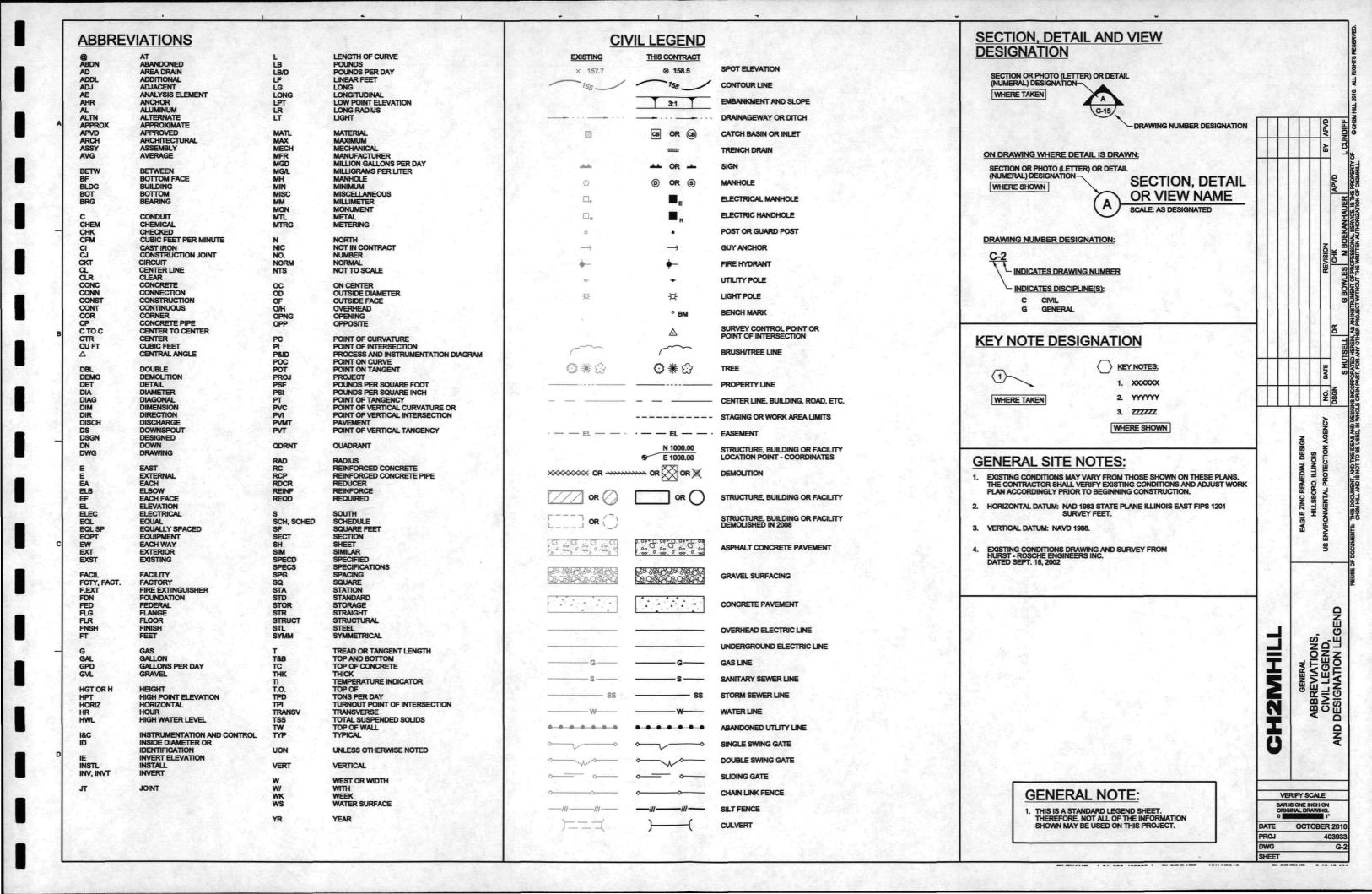
INDEX TO DRAWINGS

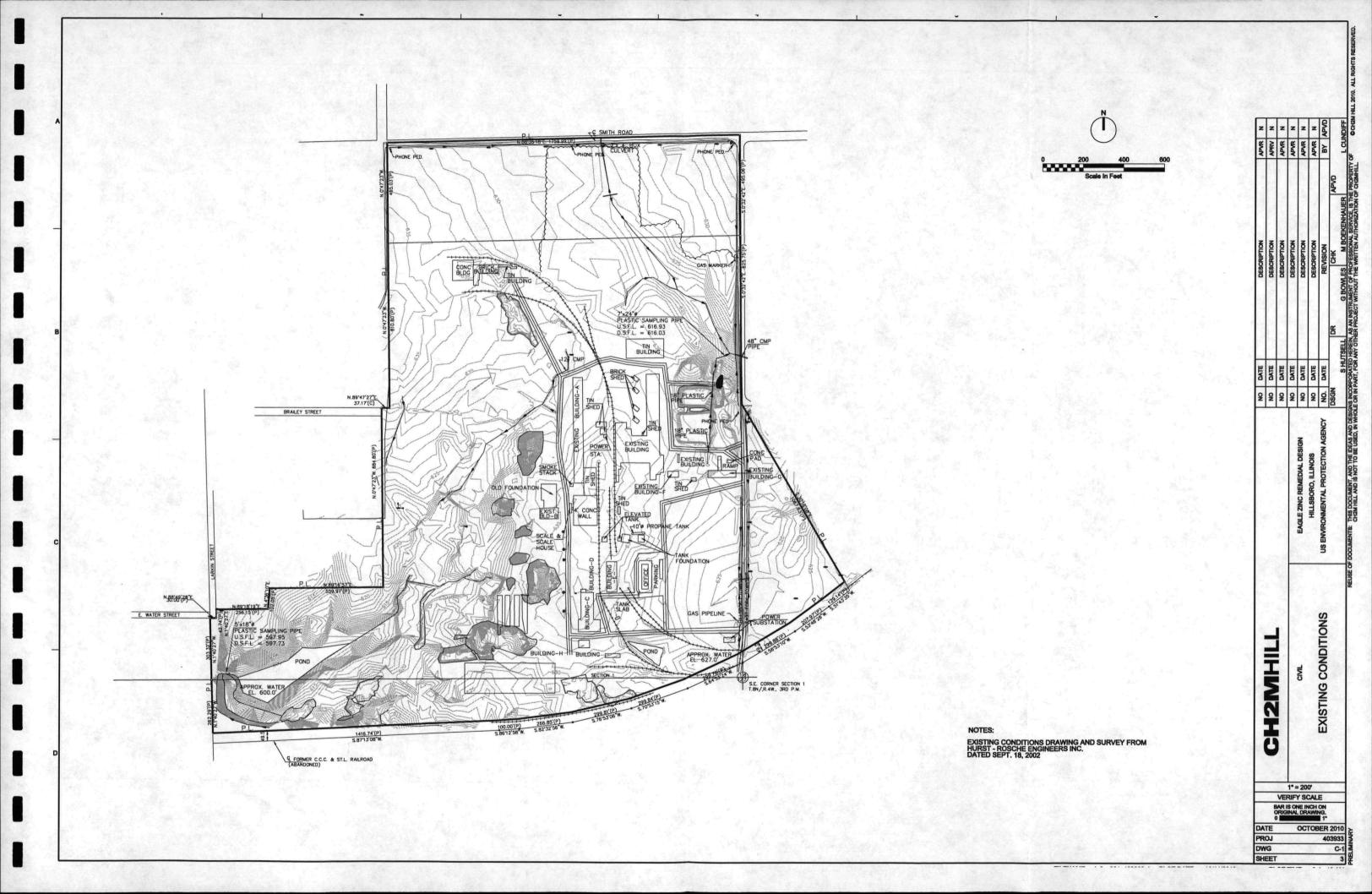
SHEET NO.	DRAWING NO.	TITLE
GENERAL		
1	G-1	TITLE SHEET, INDEX TO DRAWINGS, AND VICINITY /
2	G-2	ABBREVIATIONS, CIVIL LEGEND, DETAIL DESIGNATION LEGENDS AND GENERAL NOTES
CIVIL		
3 4 5 6 7	C1 C2 C3 C4 C5	EXISTING SITE PLAN SUBGRADE PLAN FINAL GRADING PLAN SECTIONS DETAILS

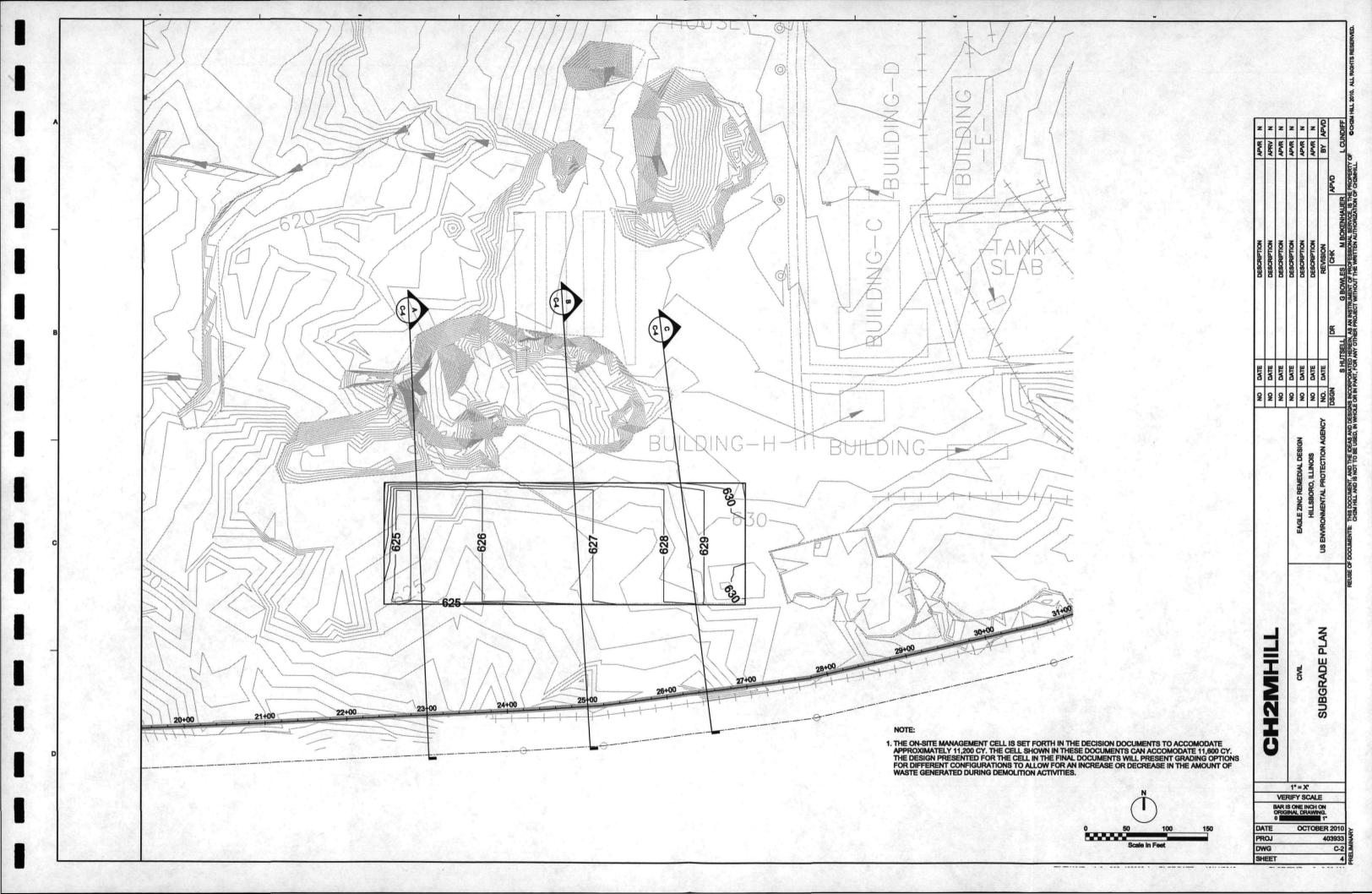


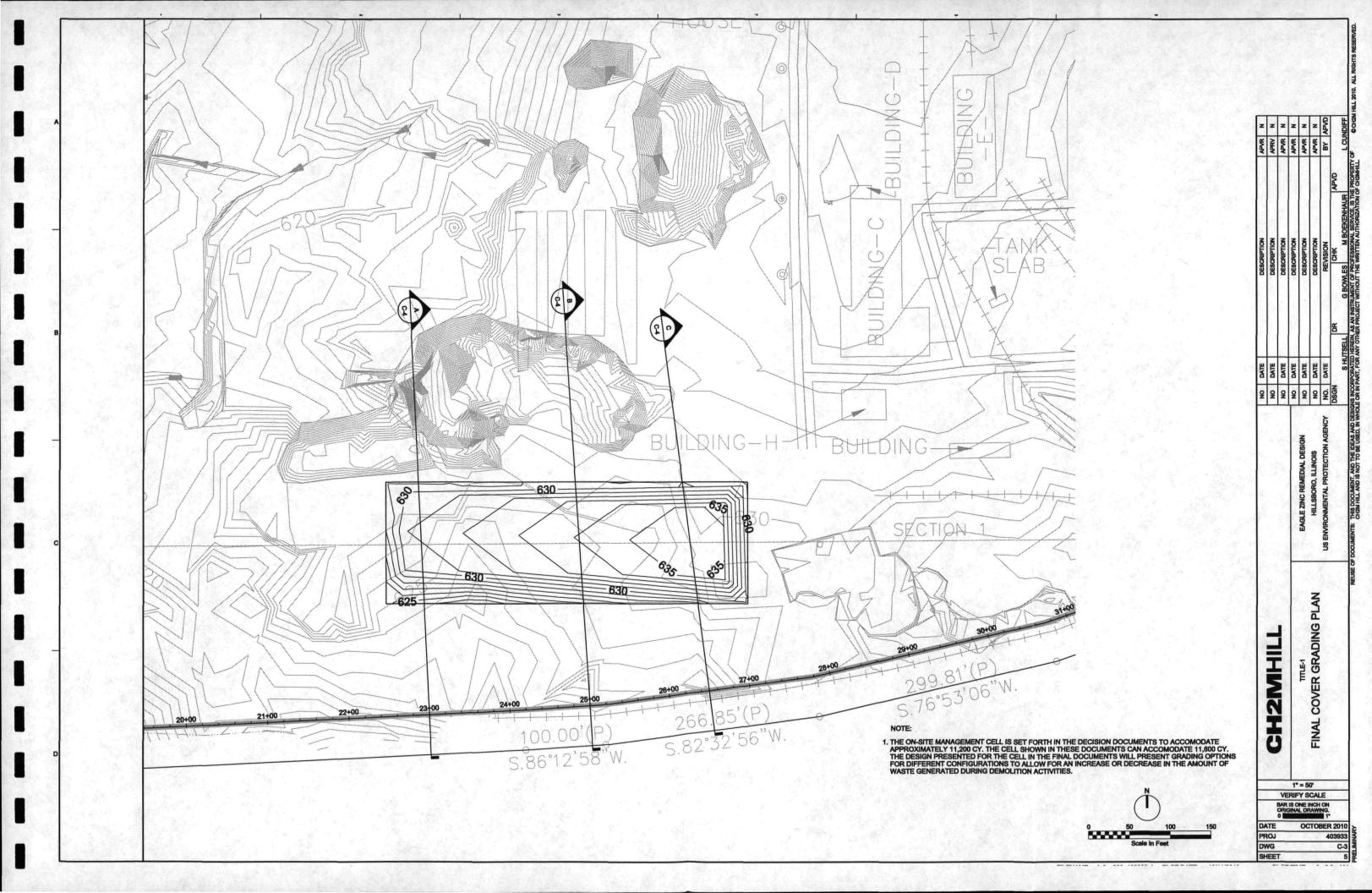


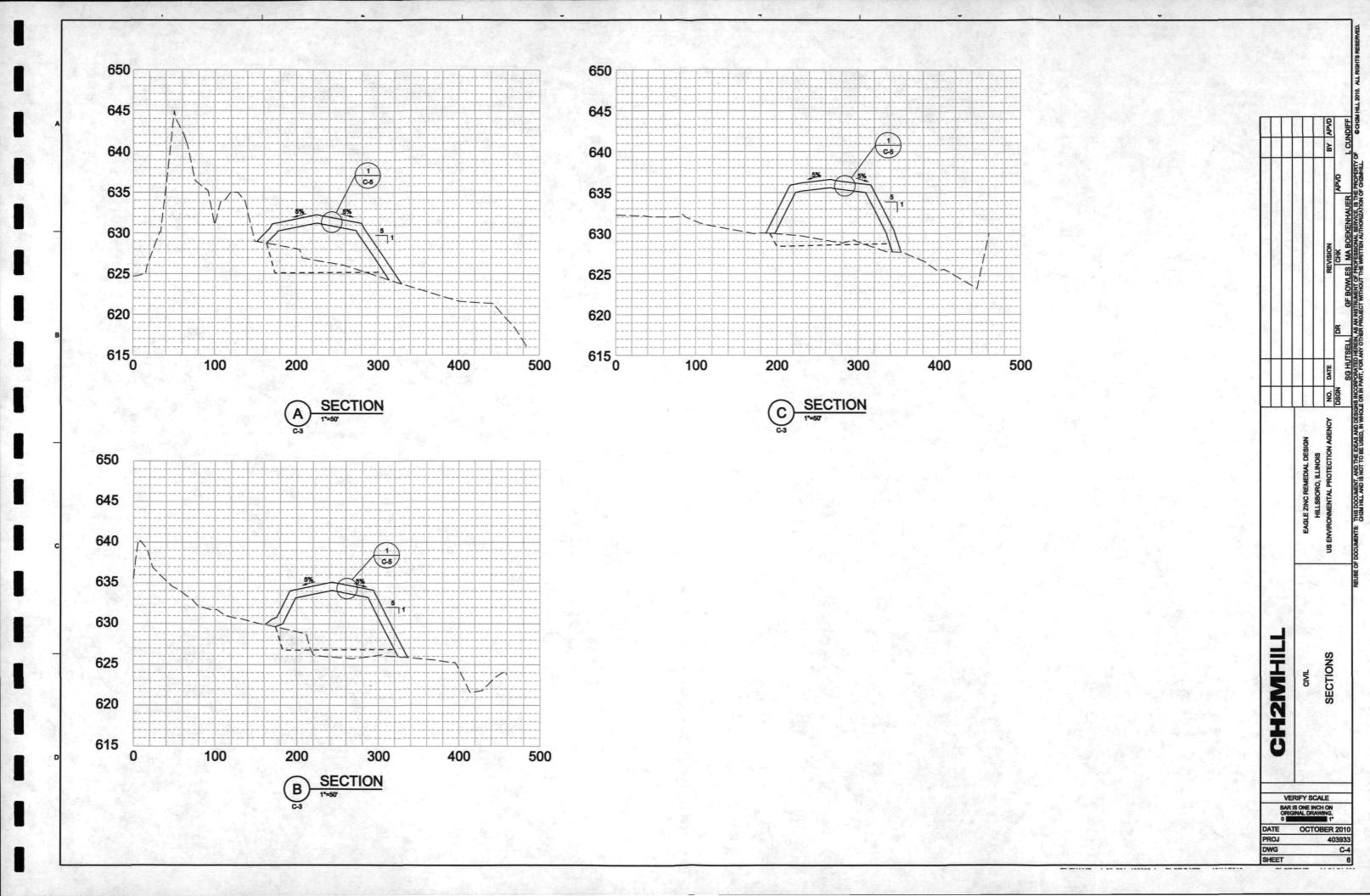


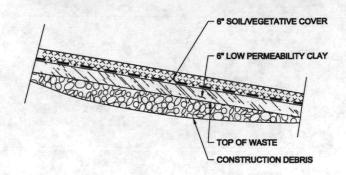




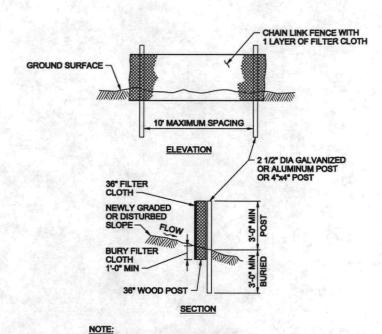






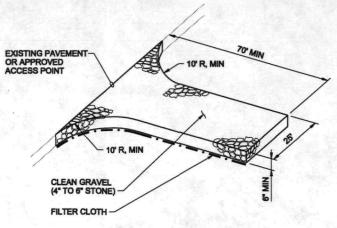


1 TYPICAL SOIL COVER DETAIL



1. POST SPACING SHALL NOT EXCEED 10"-0" TO CENTER.

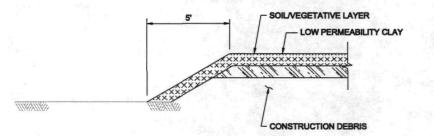
2 SILT FENCE DETAIL



NOTES:

- ADDITIONAL GRAVEL MAY HAVE TO BE ADDED PERIODICALLY TO MAINTAIN PROPER FUNCTION OF THE PAD.
- 2. INSPECT A MINIMUM OF ONCE EVERY SEVEN DAYS AND AFTER EVERY RAIN OF 1/2-INCH OR GREATER DURING CONSTRUCTION. TOP DRESS WITH STONE AS NECESSARY TO PREVENT TRACKING OR FLOWING OF SEDIMENT OUT OF WORK AREA.

3 CONSTRUCTION ENTRANCE DETAIL



4 TYPICAL COVER TERMINATION DETAIL

NTS

CH2MHILI DETAILS VERIFY SCALE BAR IS ONE INCH ON ORIGINAL DRAWING.

DATE OCTOBER 2010

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PROJ

SHEET

Appendix B Cost Estimate

Eagle Zinc Superfund Site Hillsboro, Illinois BASIS OF ESTIMATE



Project Name:

Eagle Zinc

Class Estimate:

Class 4

Requested By:

Lonnie Reese/ ATL

Estimated By:

Kathleen Roy/ATL

Estimator Phone:

678.530.4544

Estimate Date:

October 20, 2010

Kathleen Roy/ATL ESTIMATOR

Purpose of Estimate

The purpose of this Engineer's Estimate for Project Cost is to establish an Engineer's opinion of probable cost for the Preliminary Design Stage.

General Project Description

The project involves the decontamination of the Eagle Zinc site located in the northeast sector of Hillsboro, IL.

Overall Costs

The following is a summary breakdown of the costs. See attached breakdown for additional information.

yeakdown

Base items	\$349,000
Subtotal	\$349,000
Subtotal	\$349,000
Contingency (5%)	\$17,000
SIOH (5.7%)	\$21,000
Total Project Cost	\$387,000

Scope of Work

- Onsite Management Cell with Soil Cover—Consolidation of demolition debris and a 1-foot soil cover will be placed onsite to temporarily manage the consolidated debris. The vegetative portion of the soil cover will use native grasses, which will require limited maintenance.
- Management of Wastes Nonhazardous waste will be managed onsite under the 1-foot soil cover. Any hazardous waste will be placed onsite and will be managed consistently with Resource Conservation and Recovery Act (RCRA) waste pile requirements and incorporated into the final remedial action.

Markups

The following typical contractor markups where applied to the Cost Estimate:

Owner Markups

Escalation to midpt of construction 4.72% Sales Tax 0%

Contingency SIOH	5% 5.7%
Contractors Markups	
JOOH	8%
HOOH	5%
Profit	5%
Insurance	2.25%
Bond	1.58% (Bond Table, Class B)
Design Contingency	10%

Escalation Rate

See attached escalation calculation sheet for rate computation.

Estimate Classification

This Class 4 estimate is prepared based on limited information, where little more than proposed facility type, its location, and building sizes are known. Strategic planning purposes include but are not limited to, market studies, assessment of viability, evaluation of alternate schemes, project screening, location and evaluation of resource needs and budgeting, and long-range capital planning. Examples of estimating methods used would include cost/capacity curves and factors, scale-up factors, and parametric and modeling techniques. Typically, little time is expended in the development of this estimate. The expected accuracy ranges for this class 4 estimate are –15% to -30% percent on the low side and +10% to +50% percent on the high side.

The cost estimates shown, which include any resulting conclusions on project financial or economic feasibility or funding requirements, have been prepared for guidance in project evaluation and implementation from the information available at the time of the estimate. The final costs of the project and resulting feasibility will depend on actual labor and material costs, competitive market conditions, actual site conditions, final project scope, implementation schedule, continuity of personnel and engineering, and other variable factors. Therefore, the final project costs will vary from the estimate presented here. Because of these factors, project feasibility, benefit/cost ratios, risks, and funding needs must be carefully reviewed prior to making specific financial decisions or establishing project budgets to help ensure proper project evaluation and adequate funding.

Cost Resources

The following is a list of the various cost resources used in the development of the cost estimate.

- R.S. Means cost publications
- Mechanical Contractors Association Labor Manual
- National Electrical Contractors Association Labor Unit Manual (NECA)
- CH2M HILL Historical Data
- Estimator Judgment

Labor unit pricing based on the US National Average.

Estimate Methodology

This cost estimate is considered a bottom rolled up type estimate with detailed cost items and breakdown of Labor, Materials and Equipment. The estimate may include allowance cost and dollars per SF cost for certain components of the estimate.

Major Assumptions

The estimate is based on the assumption the work will be done on a competitive bid basis and the contractor will have a reasonable amount of time to complete the work. All contractors are equal, with a reasonable project schedule, no overtime, constructed as under a single contract, no liquidated damages.

This estimate should be evaluated for market changes after 90 days of the issue date. It is assumed that much of the fabricated equipment will be shipped from the mainland USA.

- Work outside of boundary limits is not included in this estimate.
- Assumed the construction will last 3 months and will start in September 2011

Excluded Costs

The cost estimate excludes the following costs:

- Non-construction or soft costs for design, services during construction, legal and owner administration costs.
- Material Adjustment allowances above and beyond what is included at the time of the cost estimate.
- The north face and some of the east and west exterior wall facade

Reference Documents

The cost estimate is based upon the CH2M HILL draft estimate dated October 2010.